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The following communications were read :—

I. On Astronomical Refraction near the Horizon. By Mr. Henderson.

The results, mentioned in this paper, were obtained by Mr. Henderson from observations, made with the mural circle at the Cape of Good Hope, of the apparent zenith distances of stars which passed the meridian of that place at greater zenith distances than 85° , for the purpose of procuring additional materials for illustrating the subject of astronomical refractions near the horizon. The stars selected were those lying on both sides of the zenith ; and, from the known declinations of the stars and the latitude of the observatory, the true zenith distances of the stars were computed : the differences between the true and observed zenith distances shewed the observed refractions. Five stars were chosen to the north, and eleven to the south, of the zenith : 73 observations were made of the former, and 113 of the latter. The refractions are computed in each case from the tables of Bessel and Ivory ; those of the former being increased in the ratio of 1 to 1.003282 : and the differences of each table from the observed refraction are set down against its respective observation. The general result shews that, except in the case of four or five stars, the tables of Ivory require less correction than those of Bessel. Mr. Henderson concludes his paper by remarking “ that astronomers in the northern hemisphere are now enabled to determine, from their own observations, the refractions of southern stars as well as of northern ; the declinations of many of the southern stars having been ascertained with the requisite accuracy.”

II. Observations of Halley's Comet, made at the Observatory at Madras. By Mr. J. G. Taylor.

These observations, fourteen in number, were made on the meridian with the 5-feet transit instrument, and 4-feet mural circle ; and are a valuable addition to the several observations that have been made, in the southern hemisphere, of this remarkable body. The observations extend from February 19 to March 21, 1836, both inclusive : and Mr. Taylor remarks, that the right ascensions may be depended upon to 1 second of time, and the declinations to 20 or 30 seconds of space ; the extreme faintness of the comet

(which would not allow the wires to be illuminated) preventing more accurate results.

III. Observations of the Solar Eclipse of May 15, 1836. By Mr. Shearman.

These observations were made in Camden Street, Camden Town, with a 4-foot Gregorian reflector, of $5\frac{1}{2}$ inches aperture, and power of 65.

First observed contact, at	5 ^h	24 ^m	21 ^s	} true sidereal time.
End of the eclipse	8	12	25	

These times were ascertained with a small transit instrument; and Mr. Shearman thinks that they are true within one second. The final separation of the moon from the sun's disc was exceedingly well marked, and the lunar irregularities could be observed quitting the apparent contact for an instant, after the true line of the two orbs might be pronounced to have separated. Mr. Shearman made several experiments on the effect of the sun's rays on various substances, which are given in detail.

IV. Observations of the Annular Eclipse of the Sun, May 15, 1836. By Lieut. C. Hopkins, R.N.

The place of observation was East Percy Street, North Shields; and the observations were made with a $4\frac{1}{2}$ -foot achromatic telescope: the times were,

Beginning, or first contact	1 ^h	43 ^m	16 ^s	} mean time.
End, or last contact	4	28	55	

Lieut. Hopkins states, that at 3^h 3^m 59^s the sun was seen all round, outside the moon; but he does not give the time of the commencement or end of the annular appearance, nor does he state how he corrected his chronometer.

V. On the position of the Ecliptic, as inferred from Observations made with the Cambridge Transit and Mural Circle, in 1835. By Mr. Airy, Astronomer-Royal.

The number of observations of the sun, used for this determination, is 114 transits and 129 polar distances, in each of which both limbs were observed. The method of treating these observations is similar to that already employed by Mr. Airy, in Vol. VIII. and IX. of the *Memoirs* of this Society. Tables are given, shewing the monthly means of the errors in the sun's place, and the equations of condition by which the results are obtained. From those expressions, it appears that the sun's place (as determined from observation) is north of the assumed ecliptic (whose inclination is that assumed in the *Nautical Almanac*, and the equinox that assumed in the catalogue of stars) by the quantity

$$- 0''.769 \cos \odot - 0''.233 \sin \odot + 0''.389$$

The first term shews, that the right ascension of the stars, by which the sun's right ascension has been determined, ought to be